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ACADEMIC MEDICINE

JOURNAL OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Beyond the College Walls

Health Care Reform: Prospects and Progress

The Medical Profession in the Environmental Arena

16 Years of a Required Family Medicine Clerkship

Teaching about Quality and Cost of Care

Physicians' Second Thoughts about Their Careers

Comparing Students' Preparation and Performance

Support Services of Residencies in Six Specialties

Laboratory Exercises in the Preclinical Curriculum

Medical Students and Abortion

The Position of Chief Resident: Directors' Views

Book Reviews

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Young Physicians Most and Least Likely to Have Second Thoughts about a Career in Medicine

JACK HADLEY, Ph.D., JOEL C. CANTOR, Sc.D., RICHARD J. WILLKE, Ph.D., JUDITH FEDER, Ph.D., and ALAN B. COHEN, Sc.D.

Abstract—To identify factors associated with apparent disaffection with medicine as a career, the authors analyzed data for 4,931 young physicians surveyed in 1987. Using survey responses, the authors classified 932 of the physicians (18.9%) as most likely to have second thoughts about their career choices and 1,094 (22.2%) as least likely to have second thoughts. The group with the greatest reservations included significantly higher proportions of white women, blacks, and Hispanics. This group reported significantly lower incomes, higher educational debt, and more hours and patients' visits per week. Among employee physicians, those most disaffected were significantly more likely to report inappropriate use of tests and procedures and lack of autonomy in their practices. The authors conclude that it is important to reexamine the heavy reliance on debt financing of medical education, especially for minority students, and to explore the equality of career opportunities for women and minorities in medicine. *Acad. Med.* 67(1992):180–190.

In recent years, newspapers and magazines have published numerous stories highlighting the difficulties and strains of both becoming a doctor and practicing medicine.[1–6] High medical school tuition and large educational debts, long hours, high malpractice premiums and malpractice awards, too many doctors in many areas, and the growing corporate influence in medicine have all been cited as factors making medicine a less attractive career than in the past. A survey conducted in 1989[2] found that 39% of the physicians interviewed would either definitely or probably not go to medical school if they were in college today, knowing what they now know about medicine as a career. Even more recently, a survey[7] of physicians in internal medicine showed that internists' satisfaction with their practices has declined markedly over time.

In trying to assess these reports, we thought it reasonable to ask whether these figures represent anything new about physicians, and whether physicians' career concerns differ from those of other professionals. Although the issues of physicians' and other professionals' career satisfaction have not received extensive analysis, some evidence is available. In a survey[8] of a national random sample of 2,700 physicians conducted in 1973, Colombotos and Kirchner found that only 14.4% had "slight" or "serious" doubts about their decisions to become a physician, while 85.6% had "no doubt at all." Only 3.7% said that they were "not happy" with their careers as physicians. Comparing the 1973 and 1989 surveys clearly suggests that there has been a significant deterioration in physicians' attitudes about their profession.

The American Bar Association conducted two studies[9] of the views of young lawyers, one in 1984 and the other in 1990. In the former, 15% said that they were somewhat (12%) or very (3%) dissatisfied with their current jobs. In 1990, the proportions were 14% somewhat and 5% very dissatisfied. While we realize that a question about current job satisfaction is not equivalent to asking about satisfaction with one's choice of profession, we find it important that another 1990 survey[10] reports that 21% of lawyers were either somewhat (16%) or very (5%) dissatisfied with their current positions, but only 19% said they would choose another career if they had to do it over again.

These reports suggest that physicians' perceptions of a career in medicine may be both more critical than those of other professionals and worsening over time. The goal of our study was to identify factors associated with the apparently high level of second thoughts or regrets that physicians are expressing about their choices of medicine as a career. Are physicians with second thoughts about having become doctors significantly different from other physicians in terms of their backgrounds or current practice situations? If there are significant

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differences, are there any implications for broader social goals, such as improving access to medical care, controlling health care costs, or ensuring the quality of care?

The responses of physicians who are women or racial or ethnic minorities are of particular interest. Increasing the representation of such groups in medicine has been a high priority of medical education and of public policy generally. Once in practice, are minority and women physicians as likely as their white male colleagues to have second thoughts about a career in medicine?

Clearly, an exploratory effort, such as the present study, that identifies and compares the views of physicians at a single point in time cannot provide definitive answers to all of the questions raised. Nor are data available in this analysis to address the psychological, emotional, or other personal factors that could be associated with dissatisfaction. However, by analyzing the practice situations of a large sample of almost five thousand young physicians, our research can contribute to the understanding of both career and current job dissatisfaction, even if it does not identify all of their determinants.

Data and Method

The methodology of this study is reported in three sections. The first describes the data that were analyzed in this study; the second, the construction of the comparison groups of physicians; and the third, the methods used to analyze the data from the comparison groups.

Data

The data analyzed in this report were collected by the American Medical Association's (AMA's) Education and Research Foundation in 1987 as part of a study of the practice patterns of young physicians. (Findings regarding issues other than career satisfaction are reported elsewhere.[11]) The survey was limited to young physicians on the assumption that those just starting out in practice would be influenced more by recent changes in medical education financing and in the health care market than would established physicians. Consequently, young physicians' experiences would be a better barometer of likely future changes than would the experiences of physicians in general.

For the purpose of our study, a young physician was defined to be less than 40 years old and out of graduate training for between two and six years. The first year after completing residency is often highly transitional and may not include a complete year of practice. Other research[12] suggests that physicians' practices undergo the most rapid changes in the first six years after the residency is completed.

The sample population was drawn from the AMA's Physician Masterfile, which contains information about age and training for all allopathic physicians in the United States, regardless of membership in the AMA. The eligible survey sample contained 10,352 physicians, consisting of a simple random sample of 8,651 physicians and an oversample of 1,692 black and Hispanic physicians. Minority physicians were oversampled in order to assure cell sizes large enough to permit reliable comparisons by race and ethnicity. The survey was conducted by telephone between April and November of 1987. Median interview length was 21 minutes.

Just over 10% of the sample (1,089 physicians) either were unavailable during the field period or their telephone numbers could not be obtained. Of the 9,263 physicians contacted, 5,865 (63.3%) completed interviews and 3,398 (36.7%) refused or did not complete the interview. This response rate is comparable to response rates to the AMA's ongoing Socioeconomic Monitoring System survey, which is also conducted by telephone.

The analysis reported in this paper is limited to 4,931 physicians who spent at least 20 hours per week in direct patient care and provided complete information about key variables. (There were 398 physicians not in direct patient care and 536 physicians with incomplete data.) The numbers of responses for specific questions, however, are frequently smaller because of skip patterns in the survey instrument and item-specific nonresponses.

We weighted all data to correct for differential response rates by specialty, AMA membership, country of medical school graduation (U.S. or foreign), and age, and for the initial oversample of minority physicians. A special analysis of nonrespondents to the Socioeconomic Monitoring System survey found that they are similar to respondents, which suggests that the use of these weights corrects for potential nonresponse bias.[13]

Comparison Groups

The physicians were asked early in the interview, "Given what you now know about medicine as a career, if you were in college today would you go to medical school?" Just over one-third (33.6%) of those who answered said "No." One hundred twenty-five physicians (2.5%) either responded that they were not sure or did not answer.

It is possible that some proportion of those who said "No" are not truly dissatisfied with medicine as a career. Some young physicians' responses may have reflected transitory dissatisfaction because the interview caught them on an unusually bad day. For others, an answer of "No" may have reflected their attitudes about the arduous training physicians undertake, rather than their dislike of medicine as a career once they completed training. Another difficulty with interpreting and analyzing the response to the "Would you go to medical school today" question as a measure of career satisfaction is that the answer to the question is unidimensional and dichotomous, while the underlying concepts of career satisfaction and career doubts are clearly multidimensional with many shades of grey. Among those who answered "No," there was likely to be variation in the intensities of and motivations for that response, as was likely among those who answered "Yes."

In order to refine the measurement of career regrets, we used a logistic

regression model to relate each response to the "Would you go to medical school today" question to three additional potential indicators of satisfaction with one's current practice: the report of a likelihood of leaving the current practice within two years; whether the physician would have liked to change his or her number of hours worked per week and by how much; and, for each physician who was practicing in more than one specialty or subspecialty, whether the physician would have liked to change the division of his or her time among specialties.

The results of the logistic regression, which are available on request, were then used to calculate a predicted probability of responding "Yes" to the "Would you go to medical school today" question. Not surprisingly, we found that the physicians who expected to leave, wished to decrease the number of hours they worked, or would have liked to alter the division of their time among specialties were significantly less likely to answer that they would go to medical school again.

The physicians were then divided into three groups based on the values of the predicted probabilities and their actual answers to "Would you go to medical school today." Those who answered "Yes" *and* had high predicted probabilities (75th percentile or above) were designated *least likely* to have second thoughts about becoming a physician. Those who answered "No" *and* had low predicted probabilities (less than the median) were designated *most likely* to have second thoughts. All the remaining physicians were assigned to a third, intermediate group, which included physicians whose predicted probabilities of answering "Yes" fell between the 50th and 75th percentiles, as well as physicians whose actual responses apparently contradicted their predicted responses.

The results presented focus on the two extreme groups because the intermediate group was most likely to include physicians whose responses to the questions asked were transitory or otherwise not reflective of their true career and/or job satisfaction. The intermediate group also includes physicians whose answers appeared to be unrelated to specific intentions to change their practice situations. For example, physicians who were in good practice situations, but simply didn't like medicine or, conversely, who were in difficult practices, but had strong commitments to being a doctor may be in this intermediate group. While these physicians' responses may have been perfectly valid measures of the physicians' true satisfaction, they are not necessarily the cases that should invoke a public policy response. Finally, results for the intermediate group, which are available on request, almost always fell between those of the two extreme groups.

There were 932 physicians (18.9%) in the group most likely to have second thoughts and 1,094 physicians (22.2%) in the group least likely to have second thoughts. The former included slightly more than half of the physicians who responded that they would not go to medical school again.

Analysis Methods

We first compared the two groups in terms of their specialty distributions and fixed demographic and background characteristics. We used chi-square and *t*-tests to identify significant differences between the groups most and least likely to have second thoughts. From these results, we constructed descriptive profiles of the physicians in the two groups.

We then estimated a series of multivariate regression models that have as their dependent variables measures of physicians' practice situations. Logistic regression was used for dichotomous dependent variables and ordinary least-squares regression for continuous dependent variables. The latter variables fell into four groups: (1) type of practice and whether the practice was a physician's first choice; (2) measures of income, malpractice experience, and indebtedness; (3) hours, workload, and location; and (4) for employee physicians only, practice style measures.

The key independent variables in the regression models are two dichotomous indicators of whether a physician is in the group predicted to be most or least likely to have second thoughts about having become a physician. The other independent variables are predetermined background characteristics that describe a physician's specialty, race, or ethnic group, sex, age, number of years in practice, type of medical school attended (U.S. public, U.S. private, foreign—physician being a U.S. citizen, foreign—physician being a foreign citizen), whether either parent was a physician, whether the physician's parents were lower or lower-middle income, whether the physician had lived in the current community before beginning practice there, marital status (married, never married, or previously married), and the number of children (including an interaction term between number of children and female sex).

The advantage of this approach is that it permits a rigorous test of the null hypothesis that the values of the dependent variable in the equation are the same in the most likely and least likely groups, controlling for the effects of differences between the groups in specialty mix, demographic characteristics, medical education, and family backgrounds. For example, women physicians have lower incomes and work fewer hours than men physicians.[14-16] In testing the hypotheses that incomes and that hours worked differ in the two groups, therefore, it is essential that the effects of gender be accounted for separately from the effects of career regrets.

The basic form of the regression model is

$$Y_i = A_i + \beta_{1i}ML + \beta_{2i}LL + \Sigma_j \alpha_{ij}X_j,$$

where Y_i = ith dependent variable;
A_i = intercept term, which implicitly includes the intermediate group physicians;
ML = 1 if the physician is in the group most likely to

have second thoughts, 0 otherwise;

LL = 1 if the physician is in the group least likely to have second thoughts, 0 otherwise; and

X_j = control variables (specialty, race, sex, etc.).

The intermediate group of physicians is the omitted reference group, which means that the coefficients β_{1i} and β_{2i} measure the differences between the intermediate group and the most and least likely groups, respectively. (If the equation is a logistic regression, then β_{1i} and β_{2i} are the logarithms of the relative odds for the two groups compared with the omitted reference group.) The null hypothesis of no difference between the most and least likely groups is equivalent to the hypothesis $\beta_{1i} = \beta_{2i}$, which is evaluated with an F-test (or chi-square test for the logistic regressions).

Results

The results are reported in two sections. The first concerns the background characteristics of the physicians in the two groups; the second concerns the characteristics related to the physicians' practice situations, including the physicians' educational indebtedness as of 1987.

Physicians' Background Characteristics

Table 1 shows that there were significant differences in the demographic and background characteristics of the physicians in the two groups. Perhaps most striking is the difference between them in their distributions by race or ethnic group and by sex. Compared with the least likely group, the physicians most likely to express second thoughts had higher proportions of white women, black men, black women, and Hispanics, and a correspondingly lower proportion of white men. Less than 62% of the physicians most likely to have second thoughts about medicine as a career were white men, compared with 70.2% of the physicians least likely to have second thoughts. In contrast, 24.5% of the most likely group were blacks or white women, compared with only 14.8% of the least likely group. Minority physicians other than blacks or Hispanics constituted a somewhat higher proportion of the least likely group.

The results also show that the two groups differed significantly with respect to their specialty distributions. However, these differences were small and occurred in only a few specialties. The most likely group had higher proportions practicing general surgery, obstetrics—gynecology, anesthesiology, and emergency medicine, and lower proportions in pediatrics, psychiatry, and pathology. Physicians practicing other specialties were more equally represented in the two groups.

There was no association between the likelihood of having second thoughts and the type of medical school attended. Nearly equal proportions of graduates from public, private, and foreign medical schools were found in the three groups. Second thoughts about career and job also appear unrelated to age or number of years in practice, although the difference in the latter, while slight, was statistically significant.

There was a significant difference between the groups in family background. Physicians least likely to have second thoughts were less likely to come from lower- or lower-middle-class families and were more likely to have a parent who was a physician. Physicians in that group were also more likely to have resided in their practice areas before beginning their practices than were the physicians classified as being most likely to regret their career choices. In addition, over 21% of the physicians in the most likely group were unmarried, compared with 13% of the least likely group.

Practice Situation Characteristics

This section is divided into three parts, each concerned with a different aspect of the question whether the characteristics of the physicians' practice situations varied with the likelihood of a physician's having second thoughts about his or her career choice.

Type of Practice, Income, Malpractice Experience, and Indebtedness. Table 2 reports whether measures of type of practice, income, malpractice experience, and educational debt varied with the likelihood of having second thoughts about having become a physician. The table shows that the physicians in the most likely group had significantly lower relative odds of being self-employed, compared with the physicians in the least likely group. Further analysis (not reported) of practice type revealed that essentially all of the difference in the relative odds of self-employment is due to those working as partners or owners in group practices. In other words, the relative odds of solo practice did not vary between the two groups ($p = .81$).

The survey also asked the physicians whether their current practices had been their first choice when they were deciding on a practice situation. The overwhelming majority, 93%, were in their first-choice practice. However, the physicians in the most likely group were more than twice as likely as the physicians in the least likely group to say that they had not gotten their first choices.

There were significant differences between the two groups of physicians with respect to income. The physicians most likely to have second thoughts had lower annual incomes by $6,889, and a lower income per hour of work, by $6.57, compared with the other group. The two groups of physicians also differed in their assessments of how their actual incomes compared with what they considered to be adequate compensation for physicians in their respective specialties with comparable experience. The physicians most likely to have second thoughts earned incomes farther below what they considered adequate. They also reported greater reductions in total billings because of providing free or reduce-fee care. We also compared, for physicians who

Table 1

Young Physicians' Background Characteristics by Predicted Likelihoods of Their Having Second Thoughts about Having Become a Physician, 1987*

Characteristic (p value in parentheses)†	Percentage Distribution		
	All Physicians (n = 4,931)	Predicted Most Likely to Have Second Thoughts (n = 932)	Predicted Least Likely to Have Second Thoughts (n = 1,094)
Race/ethnic group and sex (.000)‡			
White male	66.1	61.7	70.2
White female	15.3	19.3	12.5
Black male	2.6	3.7	1.4
Black female	1.2	1.5	.9
Hispanic male	3.6	3.5	3.1
Hispanic female	.8	1.1	.8
Male, other race	7.1	6.6	7.1
Female, other race	3.4	2.8	4.1
Medicine specialty (.038)‡			
General/family practice	16.5	15.9	15.6
General/internal medicine	13.7	14.2	13.4
Internal medicine subspecialty	13.4	12.6	13.4
General surgery	3.5	3.2	2.6
Surgery subspecialty	13.6	13.5	14.5
Pediatrics	8.8	6.9	10.3
Obstetrics/gynecology	6.7	8.6	6.8
Radiology	4.5	4.7	5.2
Psychiatry	4.2	3.5	4.3
Anesthesiology	5.5	6.9	5.0
Pathology	2.0	1.0	2.2
Emergency medicine	2.6	2.5	1.4
Other specialties	5.2	6.3	5.4
Type of medical school (.692)‡			
Private medical school	29.8	28.0	29.4
Public medical school	53.3	57.3	53.2
Foreign medical school, U.S. citizen	3.9	3.3	3.7
Foreign medical school, foreign citizen	13.0	11.4	13.7
Marital status (.000)‡			
Never married	12.1	14.3	9.6
Previously married	4.7	7.3	3.4
Currently married	83.2	78.4	87.0
Parent is a physician (.036)§	15.0	14.2	17.3
Family is of lower or lower-middle economic class (.000)§	19.1	22.0	16.2
Resided in the practice community prior to beginning practice (.000)§	40.8	36.6	43.6

*In 1987, young physicians responded to a survey designed to identify factors associated with physicians' disaffection with medicine as a career. The classifications presented (*most likely* and *least likely*) are based both on the physicians' predicted probabilities of answering "Yes" and on their actual answers to the question "Given what you now know about medicine as a career, if you were in college today would you go to medical school?" See text ("Data and Method" section) for details about how the predicted probabilities were determined.

†For two characteristics, mean values were determined: the average age of all physicians and of those in both groups was 34.7 years (.868); the average years in practice for all physicians and those in the *most likely* group was 3.4 years; that for those in the least likely group was 3.5 years (.005). See footnote § for statistical information.

‡Based on chi-square test of the null hypothesis that distributions within the most likely and least likely groups are identical.

§Based on t-test of the null hypothesis that means of variables are equal in the most likely and least likely groups.

practiced in fee-for-service settings, the average fees charged for an intermediate office visit with an established patient. The reported fees, $34.28 and $35.04, were comparable, and not significantly different ($p = 0.31$).

Two other factors often associated with physicians' dissatisfaction are malpractice experience and educational indebtedness. The results in Table 2 show that, on the one hand,

there was no significant difference between the two groups with respect to their malpractice expenses or the likelihoods of their having been involved in at least one malpractice claim since starting practice. On the other hand, the physicians in the most likely group carried a significantly larger educational debt ($31,294 versus $23,703) and had an annual repayment on that debt in 1987 that was more than three times as high as that of the physicians least likely to have second thoughts ($5,106 versus $1,667).

Hours, Workload, and Location. As shown in Table 3, the physicians most likely to have second thoughts worked 6.3 hours more per week on average than did those least likely to have second thoughts. On an annual basis, the greater number of total hours per week is equivalent to working five additional 60-hour weeks. (Weeks worked per year did not vary significantly.) The bulk of the difference was due to longer night and weekend hours. The difference in the numbers of administrative hours per week was small, though statistically significant.

Consistent with their longer hours per week, the physicians most likely to have second thoughts also reported more patients' visits per week than did the physicians in the other group. However, we found no significant difference between the two groups in the characteristics of the patients they treated, other than the difference in reduced billings for free or reduced-fee care reported in Table 2. The physicians in the two groups reported treating similar proportions of patients who were poor (20.9%), uninsured (8.9%), had chronic mental illnesses (5.6%), or had disabilities (7.7%). Medicare (24.5%) and Medicaid (10.5%) patients were spread equally across their practices as well. (Results are available on request.)

With respect to location, the results show that the physicians most likely to have second thoughts were significantly more likely to be practicing in nonmetropolitan areas. Not surprisingly, these areas had significantly fewer physicians relative to

Table 2

Young Physicians' Types of Practices, Incomes, Malpractice Experiences, and Educational Debts by Predicted Likelihoods of Their Having Second Thoughts about Having Become a Physician, 1987*

Category	Total No. Responding	Percentage or Mean Value			*p* Value for Difference between Most and Least Likely Groups in Relative Odds or Mean Value†
		All Physicians	Predicted Most Likely to Have Second Thoughts	Predicted Least Likely to Have Second Thoughts	
Type of practice					
Percent self-employed	4,927	53.9	49.5	63.4	.000
Percent not in "first-choice" practice	4,931	6.9	9.7	4.8	.000
Income measures					
Net annual income	4,406	$96,044	$94,549	$101,977	.030
Net income per hour	4,396	$36.54	$33.38	$39.93	.000
Percent reduction in billing for free or reduced-fee care‡	2,401	14.3	16.1	13.9	.020
Actual income as percent of self-reported "adequate" income§	4,931	88.2	82.9	93.8	.000
Malpractice					
Malpractice expense, 1986	3,922	$11,211	$11,673	$11,085	.990
Percent who had at least one malpractice claim since beginning practice	4,897	13.4	15.0	12.8	.583
Educational debt					
Education debt at graduation, 1987 dollars	4,845	$24,972	$31,294	$23,703	.050
Annual debt repayment in 1987‖	4,065	$3,295	$5,106	$1,667	.020

*In 1987, young physicians responded to a survey designed to identify factors associated with physicians' disaffection with medicine as a career. The classifications presented (*most likely* and *least likely*) are based both on the physicians' predicted probabilities of answering "Yes" and on their actual answers to the question "Given what you now know about medicine as a career, if you were in college today would you go to medical school?" See text ("Data and Method" section) for details about how the predicted probabilities were determined.

†Derived from a multivariate regression model that controls for the physician's specialty, sex, race or ethnic group, marital status, number of years in practice, type of medical school, physician parents, parental income, and prior residence in the current community.

‡Fee-for-service physicians only.

§Respondents were asked what they considered an adequate annual income for a physician in their specialty and at their career stage.

‖Assumed to be 0 for physicians who reported no debt or debt less than $10,000 at graduation from medical school.

Table 3

Young Physicians' Hours, Workloads, and Locations by Predicted Likelihoods of Their Having Second Thoughts about Having Become a Physician, 1987*

Category	Total No. Responding	Percentage or Mean Value			*p* Value for Difference between Most and Least Likely Groups in Relative Odds or Mean Value†
		All Physicians	Predicted Most Likely to Have Second Thoughts	Predicted Least Likely to Have Second Thoughts	
Hours					
Total hours worked last week	4,931	59.1	62.7	56.4	.000
Night and weekend hours worked last week	4,157	11.8	14.6	9.8	.000
Hours spent in administrative activities last week	4,243	5.7	6.2	5.1	.010
Workload					
Total patients' visits last week	4,147	84.1	88.8	82.3	.020
Location					
Percent in a nonmetropolitan area	4,931	18.8	22.0	17.9	.028
Physicians per 100,000 population, 3-digit zip code area	4,921	546.4	443.0	555.3	.010

*In 1987, young physicians responded to a survey designed to identify factors associated with physicians' disaffection with medicine as a career. The classifications presented (*most likely* and *least likely*) are based both on the physicians' predicted probabilities of answering "Yes" and on their actual answers to the question "Given what you now know about medicine as a career, if you were in college today would you go to medical school?" See text ("Data and Method" section) for details about how the predicted probabilities were determined.

†Derived from a multivariate regression model that controls for the physician's specialty, sex, race or ethnic group, marital status, number of years in practice, type of medical school, physician parents, parental income, and prior residence in the current community.

population than did the communities in which physicians least likely to have second thoughts were practicing.

Style of Practice. A final set of questions in the survey of young physicians asked the respondents who were employees to evaluate the "style" of the practices in which they worked. The goal of these questions was to assess employee physicians' autonomy in caring for their patients and the perceived appropriateness of the use of four broad classes of services: consultations and referrals, routine diagnostic tests, expensive tests and procedures, and standardized protocols. These questions were not asked of self-employed physicians because it was felt that responses about their own practices might not be completely candid. Employee physicians, because they practice within frameworks prescribed by their employing organizations, may have less control over patients' treatment than do self-employed physicians. (Of the 4,931 physicians who responded to the survey, 2,298 were employees; of the employees, 471 (20.5%) were in the most likely group, and 400 (17.4%) were in the least likely group).

Table 4 shows that, with the exception of control over one's work schedule, approximately 75% or more of all the employee physicians did not seem to have serious concerns about their autonomy or about the over- or underuse of the services they were asked about. Even with respect to control of their work schedules, more than half (57.4%) felt that they had adequate autonomy.

However, the results reported in Table 4 also clearly show that the physicians most likely to have second thoughts about their career choices were much more likely to respond negatively to the autonomy questions than were the physicians who were least likely to express regrets about their career choices. Except for the question about keeping patients in the hospital, the most likely group's relative odds of responding "No" were two to almost seven times greater. The greatest differences were in the responses to the questions about having the freedom to spend

Table 4

Young Employee Physicians' Preceptions about Practice Style and Quality by Predicted Likelihoods of Their Having Second Thoughts about Having Become a Physician, 1987*

Questionnaire Item	Total No. Responding	Percent Answering			*p* Value for Difference between Most and Least Likely Groups in Relative Odds†
		All Employee Physicians	Predicted Most Likely to Have Second Thoughts	Predicted Least Likely to Have Second Thoughts	
Percent answering "no" to **As a general rule, would you say that in this practice you have the freedom to:**					
Spend sufficient time with your patients	2,277	22.7	35.2	11.1	.000
Carefully review patients' medical histories and test results	2,287	15.6	24.7	4.4	.000
Hospitalize patients who, in your opinion, require it	1,979	9.4	12.8	5.9	.003
Keep patients in the hospital for the lengths of time you think are appropriate	1,714	21.4	23.4	21.0	.563
Care for patients even when they are unable to pay the fees and charges	2,187	9.9	15.8	9.1	.002
Order tests and procedures whenever you want to	2,252	13.8	18.7	7.3	.000
Control your own work schedule	2,298	42.6	55.3	27.4	.001
Percent responding to **Thinking about this practice in general, please tell me for each of the following whether you think they are used about the right amount, underused, or overused:**					
Consultations and referrals	2,260				
Overused		12.6	13.6	9.0	.030
Underused		12.6	15.7	7.4	.000
Right amount		74.8	70.7	83.6	—
Routine diagnostic tests	2,288				
Overused		25.4	30.3	21.0	.004
Underused		5.0	7.3	1.9	.001
Right amount		69.6	62.4	77.1	—
Expensive tests and procedures	2,278				
Overused		17.8	23.7	16.1	.007
Underused		12.2	15.8	8.9	.004
Right amount		70.0	60.5	75.0	—
Standardized protocols	2,151				
Overused		8.4	11.0	5.8	.020
Underused		27.4	28.8	25.3	.212
Right amount		64.2	60.2	68.9	—

*In 1987, 4,931 young physicians responded to a survey designed to identify factors associated with physicians' disaffection with medicine as a career. Of these physicians, 2,298 were employees; 471 (20.5%) of the employees belonged to the group classified as *most likely* to have second thoughts about their careers, and 400 (17.4%) belonged to the *least likely* group. The classifications are based both on the physicians' predicted probabilities of answering "Yes" and on their actual answers to the question "Given what you now know about medicine as a career, if you were in college today would you go to medical school?" See text ("Data and Method" section) for details about how the predicted probabilities were determined.

†Derived from a multivariate regression model that controls for the physician's specialty, sex, race or ethnic group, marital status, number of years in practice, type of medical school, physician parents, parental income, and prior residence in the current community.

sufficient time with patients and to carefully review patients' medical histories and test results. The one area in which the groups' responses were similar, the question about having the freedom to keep patients in the hospital for the lengths of time the physician thinks appropriate, may have been affected more than the other areas by factors external to the physicians' practices, such as insurance company utilization review and hospital guidelines for length of stay.

The responses concerning over- or underuse of consultations, tests, and protocols suggest that the physicians in the most likely group had a higher probability of being in practices that deviated on either side of "optimal" use than had the physicians in the least likely group. Although more employee physicians responded that both routine and expensive tests were overused, underuse appears to have occurred as well, and the physicians who were in the underusing practices had a higher probability of being in the most likely group than had other physicians. Conversely, more than three times as many physicians thought that standardized protocols were underused rather than overused, and the relative odds of citing underuse did not vary across the groups being compared.

Discussion

There are many possible reasons that a young physician might have for stating that, in retrospect, he or she would elect not to seek a career in medicine. We did not explore the role of psychological, emotional, or other personal factors that could be important determinants of physicians' dissatisfaction or second thoughts. Rather, our goal was to determine whether other, more objective measures of demographic and practice characteristics at the time of the survey related in a systematic way to physicians' statements about their feelings of satisfaction or dissatisfaction with medicine as a career.

We found that lower incomes, longer hours, more night and weekend hours, a greater likelihood of not being in their "first-choice" positions, greater indebtedness and debt repayment levels, and greater concern (among employee physicians) with professional autonomy and the optimal use of referrals, tests, and protocols all contributed to physicians' having second thoughts about having chosen medicine as a career. (Differences in hours worked should be interpreted with caution, however, because the logistic regression model used to construct the comparison groups was based in part on whether a physician desired to change his or her hours and, if so, by how many hours.) One of the most striking and potentially most troubling findings of the analysis is that blacks, white women, and, to a lesser extent, Hispanics were overrepresented in the group of young physicians most likely to have second thoughts. Consistent with the greater representation of minorities, young physicians in the group most likely to have second thoughts were disproportionately from families of lower or lower-middle economic class and less likely to have a parent who was a physician. They also had greater educational indebtedness at graduation from medical school and had greater repayment obligations as of 1987.

This pattern of disaffection and the nature of some of the factors that contribute to it suggest that policymakers should be concerned. To the extent that young women and minority physicians serve as role models for potential future physicians, then a disproportionately high level of second thoughts among them may "send the wrong message." Aside from hindering attainment of the goal of increasing the presence of women and minorities in medicine, such disaffection among women and minority physicians could have an indirect and adverse impact on access to care. Studies[11,17] have shown that minority physicians are much more likely to treat minority patients, and some observers have argued that broadening the social and demographic mix of physicians is critical to the future of medicine. "A changing, younger profession, more broadly representative of American society, with more moderate economic expectations and a greater commitment to the primary care specialties, will be in a better position to meet the needs for health care in the next century."[18]

Policymakers should also be concerned about the nature of the practices that lead to disaffection. Long hours and lack of professional autonomy may put pressure on the quality of care, while a high rate of turnover among physicians clearly threatens the continuity of care. While disaffected physicians are unlikely to leave the practice of medicine, the practice situations they would like to leave behind may be the result of difficulties imposed by the financing or organization of our health services delivery system.

Our results suggest several possible interpretations, some of which may have implications for medical education. First, there may be a mismatch between expectations upon entering the profession and the realities of practice, particularly among physicians raised in lower-income families. Second, it appears that a poorer economic background, coupled with greater educational indebtedness, makes it difficult for many women and minority physicians to obtain the capital needed to establish a practice in a desirable setting. Third, it is possible that discrimination makes it more difficult for women and racial minorities to practice in the most desirable settings.

Further research is needed to disentangle these and other competing interpretations. If the first is found to be important, then medical schools should reexamine their curricula and their social support systems for students in order to prepare them better for the realities of medical practice. If either of the latter two is found to be important, then serious questions would be raised about impediments to successful medical careers for women and racial or ethnic minorities, and about the role of educational indebtedness in creating the impediments. Specifically with regard to discrimination, medical schools and graduate training programs should reexamine

what may be subtle forces that limit the specialty choices and career opportunities of young women and minority physicians.

In the face of major changes in the nature of medical practice, it is also appropriate to examine whether physicians' doubts or dissatisfaction relate to particular developments in the health care field. The results of this analysis allow an examination of some specific factors that may cause (or at least may be associated with) the greater likelihood of second thoughts, i.e., competition in areas with high physician-to-population ratios, malpractice litigation and premiums, and large numbers of uninsured and Medicaid patients. In general, the survey did not find an association between second thoughts and these often-cited changes in the medical practice environment. Perhaps it is because these problems, on a day-to-day basis, are so ubiquitous or, alternatively, because they are insufficiently severe to cause dissatisfaction.

In contrast, our analysis showed a strong relationship between the likelihood of second thoughts and two aspects of young employee physicians' experiences—the lack of autonomy in their practice settings, and their concerns about practice style. Employee physicians most likely to have second thoughts were four times more likely than the other group to say that they did not have sufficient time to spend with patients, and nearly seven times as likely to say that they did not have sufficient time to review patients' medical histories and test results. They were also more likely to report difficulties concerning test-ordering practices, less control over their work schedules, and underuse of consultations and referrals. Only in two areas, keeping patients in the hospital as long as needed and underuse of standardized protocols, was there no difference between the least and most satisfied groups.

Implications for Future Policy

Identifying factors related to physicians' second thoughts about a medical career raises important questions about the future. The finding that medical indebtedness is strongly associated with second thoughts should trigger concern about our society's approach to financing medical education, particularly since high educational debts are far more prevalent among minorities and physicians from low-income families. Equity in career opportunities is a long-standing goal in our society. Disproportionate dissatisfaction and high debts among minority physicians suggest that this goal may be in jeopardy. There may well be a need to restructure current methods of financing medical education.

The effects of possibly subtle discriminatory practices also demand the attention of medical educators. A better understanding is needed of how women and minority physicians in training may be steered toward or away from particular specialty choices, or may be made to feel uncomfortable participating in the full spectrum of medical training opportunities. Eventually, the promotion of qualified women and minority candidates up the academic career ladder will help break down long-institutionalized messages affecting trainees. In the meantime, today's educators must develop greater sensitivity to the needs of these students.

Our finding that the disaffection of employee physicians reflects their concerns about their autonomy to practice quality medicine also calls for further examination. This finding specifically, and the more general finding of physicians' dissatisfaction with practice arrangements, raises questions about young physicians' preparation for the practice of medicine. It is possible that there is a misalignment of expectations upon entering medical school, or even upon completing training, and the realities of practice. The majority (64%) of medical school administrators, department chairs, and faculty reported in a 1989 survey[19] that they were doing only a "fair" or "poor" job of preparing medical students to work in the "changing organizational and financing environment" of medical practice. That survey also revealed that medical educators perceive that specific, ongoing changes in the medical practice environment—rising malpractice premiums, the AIDS epidemic, the problem of the uninsured, and physician payment reform—will have an impact on medical education.[20] Medical educators should take steps to stem future physician disaffection by bringing education more in line with these daily realities of practice. For example, educators should continue to expand the share of medical training taking place in ambulatory and community settings. Greater academic exposure to health care financing and policy issues also appears to be warranted.

In conclusion, the findings from our analysis suggest that policymakers and medical educators ought not to be complacent about the future of medicine. Young physicians' perceptions regarding their career choices appear to be worsening at a time of great change in the nature of practice, and at a rate faster than those of other young professionals. It will, thus, be important in the future to monitor physicians' attitudes toward career choices and to consider appropriate policy and practice changes that address the concerns outlined in this paper. Failure to recognize and heed these concerns may unnecessarily hamper the attainment of avowed societal goals and adversely affect the future of the medical profession.

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Comparison of Medical School Performances and Career Plans of Students with Broad and with Science-focused Premedical Preparation

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Abstract—This paper reports (1) a method for classifying students according to the breadth of their premedical preparation and (2) a comparison of the medical school performances and career plans of the students thus classified. The method was developed in 1987, in part by using input from a small but representative sample of admission officers. Students were grouped according to undergraduate major, ratio of nonscience-to-science course hours, and extracurricular involvement. After tentatively classifying all individuals who had entered U.S. medical schools in 1981 as having either broad or science-focused preparation, the author compared the two most distinct groups selected from a random sample of the individuals in each classification: 59 individuals constituted the final broadly prepared group, and 73, the science-focused group. The science-focused group attained higher mean scores ($p < .05$) on three science sections of the National Board of Medical Examiners (NBME) Part I examination, and the broadly prepared group scored higher on the Behavioral Sciences section ($p < .05$). No other significant difference was evident between the groups' mean scores on the NBME Parts I, II, or III, or in the groups' rates of experiences of academic difficulty, specialty choice distributions, or percentages of individuals deciding to pursue research careers. The author concludes that this method of classifying students is useful and that the students with less premedical focus in the sciences were able to perform well. *Acad. Med.* 67 (1992):191–196.

The report of the Association of American Medical Colleges' (AAMC's) panel on the general professional education of the physician (GPEP)[1] recommended that the baccalaureate education of physicians include studies in the humanities and social sciences. The panel expressed concern about premedical students who, hoping to gain favor with admission committees, specialize in the sciences during their undergraduate years. Balance among studies in the natural sciences, the social sciences, and the humanities was considered necessary for the development of "values and attitudes that promote caring and concern for the individual and society."[2] Panel members urged medical school admission committees to include appraisals of important values and attitudes in their selection decisions.

Participants in a national seminar on medical education sponsored by the Josiah Macy, Jr. Foundation reaffirmed views presented in the GPEP report. During his seminar presentation, Rogers[3] chided medical schools for failing to try "innovative or risky experiments in admissions and education." Similarly, Neufeld and colleagues[4] encouraged consideration of personal qualities during the selection process and urged medical schools to identify applicants with the potential to become warm, caring physicians.

Medical schools, in accord with the GPEP and other reports, are reevaluating their prerequisite courses and admission criteria and cautioning premedical students against narrow, technical concentration in the sciences.[5] An updated Medical College Admission Test (MCAT)[6] has been designed to encourage students to pursue broad undergraduate study. Empirical studies of the relationship between students' breadth of undergraduate preparation and performances in medical school have not been reported, however. Several studies[7–9] have compared the performances of medical students with different types of baccalaureate degrees and/or different undergraduate majors. The results reveal that science and nonscience majors possess equal undergraduate grade-point averages, achieve equivalent MCAT score levels, and perform similarly in medical school. Performance differences may not be observable when groups are defined solely by type of undergraduate major and/or degree. According to the Creditors,[10] students with nonscience majors report taking as many science and mathematics courses as do science majors.

The current study extends previous research by identifying and quantifying students' characteristics, in addition to undergraduate major and/or degree, that distinguish among types of undergraduate preparation. The medical school performances and career plans of students with different preparations are then compared. Initial effort was directed at developing a system for classifying undergraduate preparation. Both the GPEP report and the Macy report refer to "broad," "balanced," and "well-rounded" preparation, but neither provides an operational definition of such terms. To develop such a definition, input from a representative sample of admission officers was solicited to determine criteria typically used to identify individuals with broad undergraduate preparation and those with science-focused undergraduate preparation. It was hoped that this approach would result in a classification system generalizable to a variety of institutions.

The classification system was tested during the second part of the study. Two groups of students with different undergraduate experiences were identified and their medical school performances and career plans compared. Medical school perform-

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ance comparisons were based on the students' scores on Parts I, II, and III of the examinations sponsored by the National Board of Medical Examiners (NBME) and on the incidences of academic difficulty. Comparisons of the students' career plans were based on responses to the AAMC Graduation Questionnaire (GQ) administered to medical students just prior to graduation. Responses to the following two GQ questions were compared: (1) the type of specialty in which the students planned to seek certification and (2) the extent to which the students intended to focus their careers on research.

Classification Method

In October 1987, admission officers at seven U.S. institutions were requested to review all available application materials for their 1987 entrants and to identify ten individuals with broad undergraduate preparation and ten students who had focused heavily on the sciences during their premedical years. The schools were geographically representative and included both public and private institutions of various sizes. The participants each submitted two lists of entrants and provided a summary of criteria used in identifying the students. Applications for these students were obtained from the American Medical College Application Service (AMCAS) files, and identifying information was obscured. Using the selection criteria noted by the admission officers, the applications were examined to identify the characteristics common to entrants in each group across the various institutions. Methods demonstrated by Willingham and Breland[11] were used to glean information about the students' personal characteristics from the medical school applications.

Classification Results

Examination of the applications revealed that the entrants considered to be broadly prepared had majored in a nonscience area or enrolled in a variety of nonscience coursework and had participated in a wide variety of extracurricular activities. The science-focused entrants tended to have been physical or biological science majors with few nonscience course hours. Although extracurricular involvement was frequent among this latter group, their areas of activity were largely restricted to medical or scientific fields.

A ratio of nonscience to science course hours was computed. Courses in biology, chemistry, physics, and mathematics were considered science; all others were considered to be nonscience. Broadly prepared students tended to have a ratio of nonscience to science course hours of .60 or higher, while the value for science-focused students was typically .40 or lower.

Nonscience-related activities were classified into 13 types; the types of participation were counted for each entrant. A description of the classifications and examples of the activities included within them are the boxed list, "Types of Extracurricular Involvement Indicated by Medical School Entrants, 1987." Broadly prepared students tended to participate in at least four types of nonscience activities, while those classified as science-focused were typically active in three or fewer types.

Occasionally, students had participated in four or more activities that all fell into one category. If the activities were unrelated to the sciences and to the student's coursework, they were considered in the same manner as four types. For example, a student majoring in biology and participating in dance, drama, chorus, and art (all fine arts activities) would be credited with four types of activities. The same fine arts activities would not be counted as four types for a student majoring in a fine arts area. This reflects a decision that a broad education should encompass exposure to a variety of experiences.

Based on this examination of applications, the following operational definitions were developed. Broad preparation was defined by (1) participation in four or more types of nonscience-related extracurricular activities or participation in one type of nonscience activity extensively and separate from coursework and (2) pursuit of an undergraduate major in a nonscience area or achievement of a ratio of nonscience hours to science hours of at least .60. Science-focused preparation was characterized by (1) participation in three or fewer types of nonscience-related extracurricular activities, (2) pursuit of a biological or physical science undergraduate major, and (3) a ratio of nonscience to science semester hours of .40 or less.

Comparison Method

In 1987 a data set was retrieved from the AAMC's Student and Applicant Information Management System (SAIMS) of all 1981 entrants to U.S. medical schools ($n = 15,914$). The 1981 cohort was selected for study because sufficient time had passed for most to complete medical school and to take all three parts of the NBME.

The research was completed in several steps. Preliminary groups of broadly prepared and science-focused students were formed from the SAIMS data file using automated data elements (undergraduate major and number of nonscience and science course hours). A random sample of 125 students from each group was then selected, and their AMCAS applications were examined to further refine groupings. In order to maximize the probability of detecting group differences, only students who clearly fit into one of the defined groups were included in the study. A total of 59 broadly prepared and 73 science-focused students were retained for further study. The majority of those excluded either had high ratios of nonscience to science semester hours but had restricted their extracurricular participation to science-oriented activities, or they had low nonscience-to-science ratios but had participated in more than three nonscience activities.

In 1988, NBME, academic difficulty, and GQ data were added to the automated file after the student groupings were refined, and all identifying information was removed. Means were calculated for each group on the total and subscores of the NBME, and analyses of variance were conducted. To discover whether

Types of Extracurricular Involvement Indicated by Medical School Entrants, 1987

Activity	Description	Examples
Advisory work	Activity requiring counseling or advising	Residence hall advisor; hotline counselor
Journalism	Writing for campus newspaper or yearbook	Editor of campus newspaper; yearbook editorial staff
Community work	Organized activity performed for the benefit of the community	Lions Club; Jaycees; Big Brother/Big Sister program
Fine arts	Organized activity involving dance, drama, music, art, photography	School play; school band; yearbook photographer
Political action groups	Groups organized for particular social/political causes	Students Against Drunk Driving; No Nukes
Fraternal organizations	Groups organized primarily for social activities	Fraternity/sorority; residence hall social committee
Athletics	Organized team sport or recreational activity	Intramural hockey; horseback riding; cheerleading
Student government	Student organizations whose purpose is to deal with campus policies/rules or student life	Student council; residence hall discipline committee
Teaching	Activity in which student actively participates as an instructor	Teaching assistant; classroom aide; private tutor
Travel	Travel outside continental U.S.	Foreign exchange student; family trip to Europe
Clubs (other than above)	Clubs unrelated to the sciences, undergraduate major, or honors societies	Culture/film societies; foreign language clubs; hiking/camping groups
Nonprofessional employment	Work not requiring bachelor's degree and unrelated to science labs, hospitals, or medicine	Waiting on tables; office assistant; factory worker
Professional employment	Work requiring bachelor's degree and unrelated to science labs, hospitals, or medicine	Teacher; social worker; accountant

any observed differences on the NBME tests were attributable to premedical academic characteristics, an analysis of covariance was performed using as the covariate each student's average MCAT score (i.e., the average of the six section scores). The incidence of academic difficulty for each student was determined by the examination of data on the student's academic status. Changes in academic status, such as transfers or dismissals, are submitted periodically to SAIMS by institutions to reflect students' progress through medical school. When a student graduates, the date of graduation is noted. The presence of a code indicating that a student took a leave of absence or was required to withdraw as a result of academic problems was regarded as an indication that the student had experienced academic difficulty. In some cases, graduation had been delayed but no explicit reason for the delay, such as leave of absence for health reasons, was available. Since status code changes are not submitted for students repeating an academic semester or year, an unexplained delay in graduation was also regarded as evidence of academic difficulty. Earlier research[12,13] documents the validity of these classifications of academic difficulty. The rates of the incidences of academic difficulty in the two groups were compared using chi-square analysis.

The specialties in which graduates planned to seek certification were grouped into three categories: (1) specialties with a high degree of doctor–patient interaction (family practice, internal medicine, obstetrics and gynecology, pediatrics, and psychiatry); (2) surgery and surgery subspecialties (surgery, orthopedic surgery, neurological surgery, thoracic surgery, plastic surgery, and colon/rectal surgery); and (3) all other specialties. Chi-square analysis was used to compare the frequencies with which individuals in the two groups selected specialties in these categories. The degrees to which graduates in the groups expected to be involved in research during their careers were also compared.

Comparison Results

The results of the comparisons of the data pertaining to the broadly pre-

pared and science-focused groups are reported in three sections. The first reports comparison of NBME performances; the second, rates of incidence of academic difficulty; and the third, career plans.

NBME Performances

Statistically significant differences ($p < .05$) were evident on several of the NBME Part I tests. The broadly prepared group performed significantly better on the Behavioral Sciences section, while the science-focused group scored significantly higher on the Physiology, Biochemistry, and Pharmacology sections. No significant differences between the groups' scores were found when comparing performances on Parts II and III. The columns labeled "Unadjusted Mean" in Table 1 display data on the groups' mean performances on the NBME.

In preparation for analysis of covariance, group means on the MCAT were compared, revealing statistically significant differences ($p < .05$) on the four science sections. The group means for the sections of the MCAT were: *Biology*, broadly prepared group, 9.3, science-focused group, 10.1; *Chemistry*, broadly prepared group, 9.6, science-focused group, 10.4; *Physics* broadly prepared group, 9.5, science-focused group, 10.6; *Science Problems*, broadly prepared group, 9.5, science-focused group, 10.3; *Skills Analysis: Reading*, broadly prepared group, 9.0, science-focused group, 8.9; and *Skills Analysis: Quantitative*, broadly prepared group, 9.4, science-focused group, 9.5.

In Table 1, the columns labeled "Adjusted Mean" display group means on the NBME that were adjusted for MCAT score levels. Group differences between means lessened when adjusted for MCAT score levels, but statistically significant differences remained between the means of scores on Part I Physiology, Biochemistry, Pharmacology, and Behavioral Sciences.

Incidences of Academic Difficulty

Examination of academic status data revealed that 87% ($n = 51$) of the

Table 1

Comparison of Mean Performances on the NBME by Broadly Prepared and Science-focused Groups of 1981 Medical School Entrants*

NBME	Broadly Prepared Group		Science-focused Group		*F*-Ratio of Adjusted Means
	Unadjusted Mean	Mean Adjusted for Each Individual's Average MCAT Score	Unadjusted Mean	Mean Adjusted for Each Individual's Average MCAT Score	
Part I	($n = 48$)		($n = 64$)		
Anatomy	506.5	512.7	542.2	537.6	1.5
Physiology	483.8	490.3	533.8	529.0	5.3†
Biochemistry	508.3	513.1	553.1	549.6	4.1†
Pathology	485.7	490.6	524.5	520.9	2.3
Microbiology	512.4	526.3	545.3	541.6	.7
Pharmacology	500.5	506.0	563.4	559.3	6.7†
Behavioral Sci.	567.0	573.6	523.1	518.0	11.0†
Total score	510.8	517.7	551.5	546.4	2.5
Part II	($n = 43$)		($n = 61$)		
Internal Med.	490.5	499.5	509.6	503.3	.0
Surgery	474.5	482.3	500.8	495.4	.4
Ob.-gyn.	507.0	511.2	488.9	485.9	1.7
Prev. Med.–Public Health	513.5	525.2	512.5	504.3	2.0
Pediatrics	502.9	508.6	521.6	517.7	.2
Psychiatry	543.7	549.7	541.4	537.2	.4
Total score	505.7	515.1	514.9	508.3	.1
Part III	($n = 42$)		($n = 54$)		
Total score	516.8	520.9	521.9	518.7	.01

*In 1988, as part of a study on classifying students by the breadth of their premedical preparation, the author compared various performances of the two most distinct groups that were selected from small random samples of all the individuals who had entered U.S. medical schools in 1981: 59 individuals constituted the broadly prepared group, and 73, the science-focused group. By the end of 1987, most individuals in both groups had taken all three parts of the National Board of Medical Examiners (NBME) comprehensive examinations. The author obtained adjusted mean scores in order to discover whether observed differences on the NBME were attributable to group differences on the MCAT, by performing an analysis of covariance using as the covariate each individual's average MCAT score (i.e., the average of the six section scores).

†$p < .05$.

broadly prepared students and 92% ($n = 67$) of the science-focused students did not encounter academic difficulty. Thirteen percent ($n = 8$) of the broadly prepared group and 8% ($n = 6$) of the science-focused group experienced academic problems. A chi-square estimate revealed that group differences in academic difficulty rates were not statistically significant ($X^2 = .98$, df = 1, $p > .05$).

Career Plans

Because medical school graduates are not required to complete the GQ, responses were available for a limited number of students in the sample. Of the broadly prepared students, 63% ($n = 37$) responded to the questionnaire; 59% ($n = 43$) of the science-focused students responded. The percentages presented in the following paragraphs are based on the numbers of students for whom GQ data were available.

Comparison of GQ responses revealed that the broadly prepared students were slightly more likely to seek certification in specialty areas with high doctor–patient interaction (49%; $n = 18$) than were the science-focused students (33%; $n = 14$). The science-focused students were more likely to select the surgery specialties (16%; $n = 7$) than were the broadly prepared students (8%; $n = 3$). The science-focused group more frequently reported plans to obtain certification in other specialty areas (47%; $n = 20$) than did those with broad preparation (32%; $n = 12$). The remaining students in each group were undecided with respect to specializing. Chi-square analysis revealed that these group differences were not statistically significant ($X^2 = 2.008$, df = 2, $p > .05$).

When the students' plans for research involvement were compared, group responses were similar. Over half of each group indicated they intended to be significantly or somewhat involved in research (57% of the broadly prepared and 56% of the science-focused students). The remainder planned to have limited or no involvement in research.

Discussion

The classification system developed for this study demonstrates one method for assessing breadth of undergraduate preparation. It is hoped that the operational definitions developed in the study represent the current thinking by admission officers and provide a framework adaptable to individual institutions' needs.

Science-focused preparation as defined in this study represents traditional premedical training, the type of background often perceived by students as increasing their chances of acceptance into medical school. Broad preparation typifies the more contemporary view of premedical training advanced by the GPEP panel and others. Students who follow recent advice and pursue the latter type of training deserve reassurance that they will not be disadvantaged when faced with the medical school curriculum. The classification system was intentionally designed to maximize the likelihood of uncovering differences. The science-focused group identified by this study clearly restricted their undergraduate activities to science-related areas, whereas the broadly-prepared group had minimum exposure to the science areas.

In spite of these background differences, the groups performed similarly on all criterion measures except four sections of the NBME Part I. Statistically significant differences were found for these sections, with the broadly prepared group scoring higher on a clinically oriented section (Behavioral Sciences) and the science-focused group scoring higher on several basic-science-oriented tests (Pharmacology, Biochemistry, and Physiology). It may be that differences in preparation result in performance differences in the early years of medical school. Perhaps some basic science material is familiar to science-focused students but relatively new to more broadly prepared students. If this study had included comparisons of first- and second-year grades, additional performance differences might have been apparent.

After a period of time in medical school, the groups appeared to become more homogeneous. Mean performances on the NBME Parts II and III were equivalent. Significant differences were not evident when rates of academic difficulty were compared. The groups were equally likely to become involved in research. Although the relative proportions varied, individuals from both types of backgrounds planned to specialize in each of the three specialty areas. Because comparisons of career plans were based on very small sample sizes, observed differences should be interpreted cautiously. Statistically significant differences might have been found had sample sizes been larger.

Medical schools planning to include consideration of undergraduate preparation in their admission processes should keep in mind that operational definitions must be adapted to the unique characteristics of a particular school's applicants and tailored to meet specific institutional missions and goals. The accessibility of extracurricular activities in the undergraduate environment should be considered. A student's opportunities to participate extracurricularly may be restricted by the availability of activities, personal commitments, family responsibilities, or financial obligations. For example, a biology major who must contribute to his or her own financial support may find employment in science laboratories most easily accessible. Students attending larger institutions may have more opportunity to participate extracurricularly and may encounter a wider variety of activities. These factors must be considered to ensure that applicants are not penalized for circumstances beyond their control.

Further refinement of classification procedures might include attempts to attach personal qualities to types of undergraduate experiences. Responsibility, maturity, integrity, resourcefulness, and perseverance are attributes judged to be important personal qualities for prospective medical students.[6,14] It may be possible to identify specific experiences that enhance the development of these attributes.

Future research examining the relationships between types of extracurricular involvement and the development of certain personal qualities would be valuable. Consideration of extracurricular involvement may be particularly useful for special groups of applicants. For example, previous research has shown community involvement to be an important predictor of minority students' success in medical school.[15]

This study does not propose to establish a link between type of premedical preparation and the affective physician characteristics lauded by the GPEP panel and others. Such a conclusion could be drawn only after studying ratings of clinical performances. The results do provide assurance that students with science-focused premedical preparation and those with broad baccalaureate preparation perform similarly on the NBME examinations and progress in an equivalent fashion through medical school. For institutions that wish to emphasize the importance of broad, well-rounded undergraduate preparation, these results suggest that such preparation will not negatively affect a student's performance in medical school.

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Comparison of Support Services Offered by Residencies in Six Specialties, 1979–80 and 1988–89

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Abstract—The purpose of this study was to determine the availability of each of 19 support services offered by residencies in six specialties in 1988–89 and to compare the results with those of a similar survey performed a decade earlier. A questionnaire was sent to a random sample (576 residencies) of the nation's programs in family practice, internal medicine, obstetrics–gynecology, pediatrics, psychiatry, and surgery. Nearly all responding programs (493) scheduled residents on-call every third night or less frequently. Training programs in all the specialties studied, except pediatrics, offered fewer part-time residencies and, except psychiatry, offered more child care services. Night-shift rotations were used more often in internal medicine, obstetrics–gynecology, and pediatrics programs than in the other specialties. Family practice programs were more likely to offer support groups and various seminar-type experiences. Despite the recent attention to residents' working hours and conditions, many programs in many specialties do not yet offer a variety of commonly utilized, effective support services for residents during training. The authors conclude that with mounting pressure from legislative and regulating bodies, now is the time for the profession to voluntarily incorporate support services for residents into training programs. *Acad. Med.* 67(1992):197–202.

In the aftermath of the nationwide publicity surrounding the death of Libby Zion under the care of housestaff in a New York hospital, increased emphasis has been focused on stress, coping, and environmental support in graduate medical education. Individual residents vary in their abilities to cope, with some thriving and some becoming impaired. Impairment can be defined as a state wherein the resident's ability to care for self or others, particularly patients, is hampered because of emotional illness or substance abuse. Studies[1,2] have found that 7–12% of residents may use drugs and that as many as 10–40% of first-year residents experience depression each year.

Stress is an inevitable component of residency training. Residents are expected to be responsible for the lives of others, yet they perform often without confidence in their abilities or experience and without supervisory personnel immediately available. Pervasive throughout training, especially during the early years, is a fear of making mistakes and a dread of the effect of these mistakes on others (death or disability) and self (loss of self-esteem or reputation, or termination from the profession). Responsibilities are met in an environment where time is a precious but scarce resource: trainees experience a sense of never having enough time to provide optimum patient care, learn all that is necessary, and "get the work done." Acute and chronic sleep deprivation from extended duty hours is a regular attribute of resident life. Residents perceive a sense of isolation from family, friends, and nonmedical life because they are on call frequently, work late, and often work a portion of each weekend day even when not on call in order to provide continuity of care. Furthermore, residents are often isolated from their familiar support systems when they enter training programs in new communities, without friends or family nearby.[3]

Coping with the stress of residency can be viewed as a joint responsibility of the individual resident and the training program whose curriculum is designed to teach trainees the skills they will need to provide patient care and to enable them to serve long and productive medical careers.[4–7] The publicity surrounding the Libby Zion case catalyzed changes in state laws governing residents' working hours and supervision,[8–12] and influenced the regulation of graduate medical education through the Accreditation Council on Graduate Medical Education (ACGME). Twenty-three of the 24 residency review committees have recently included training standards focusing on residents' working hours and supervision, while recommended overall standards are currently being considered by the ACGME for all teaching hospitals.[13] For this study, the authors chose to measure what support services are currently offered by programs and how such services compare with the results of a similar survey reported by Berg and Garrard a decade previously.[14]

Method

In 1988 the authors surveyed residencies in family practice, internal medicine, obstetrics–gynecology, pediatrics, psychiatry, and general surgery to assess the availability of support services for residents. After carrying out a pilot survey at local residencies, the authors sent questionnaires to 576 randomly selected residencies. Fifty percent of the family practice residencies in the United States (197

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programs) and 25% of the programs in each of the other five specialties were surveyed (116 programs in internal medicine, 72 in obstetrics–gynecology, 60 in pediatrics, 55 in psychiatry, and 76 in general surgery).

In addition to assessing the number of first-year residents in the program, length of paid vacation, and frequency of night call, the survey assessed the availability of 19 specific support services. These services are shown in the following list, which, with minor editorial changes, reflects the wording of the questionnaire. Asterisked(*) items were also assessed in the previous survey by Berg and Garrard.

1–2. Confidential professional counseling (i.e., (1) *counselors available within the residency at reduced or no fee, or (2) benefits supplied by the residency or hospital for counseling)

3–5. Ongoing support groups for (3) *residents, (4) significant others or spouses, or (5) *residents and significant others or spouses

6. Balint-type seminars—ongoing "problem patient" seminars focused on the doctor–patient relationship

* 7. Seminars or speakers dealing with emotionally charged medical issues (for example, the dying patient)

* 8. Seminars or speakers dealing with the stresses and conflicts of being a physician (for example, physician drug abuse)

* 9. Financial advisors to help residents deal with financial concerns

*10. Formal "gripe sessions"—an avenue for voicing complaints and requests for program change

11. Resident participation in decision making—participating on hospital committees, with residency curriculum, etc.

*12. Part-time residency—decreasing the ongoing time commitment while lengthening the duration of residency (for example, shared residency positions)

13–15. Alternative residency scheduling involving time off without lengthening the duration of residency (i.e., (13) night float system, (14) postcall time off, and (15) residency-sponsored "mental health" days that allow residents half or whole days away from work)

*16. Social activities planned and sponsored by the residency (for example, parties, sports events)

17. Residency retreat—opportunities for all residents to get away from the program together, with coverage provided by the program

18. Orientation—a week- or month-long program for the new residents with limited patient care responsibilities

*19. Child care services—day care or babysitting services sponsored by the residency program or hospital and available on an ongoing basis to residents who are parents

Programs that did not respond to the first mailing were sent a second and, if needed, a third questionnaire during the first half of academic year 1988–89. Response rates were 74% in obstetrics–gynecology ($n = 53$), 79% in internal medicine ($n = 92$), 87% in pediatrics ($n = 52$), 87% in psychiatry ($n = 48$), 89% in surgery ($n = 68$), and 91% in family practice ($n = 180$); a total of 493 programs responded (86%). Examining the nonresponding programs revealed no difference in size or geographic region compared with the responding programs. The responses were analyzed to compare between specialties with respect to the availability of services in 1988–89 and, where applicable, between the present survey conducted in 1988 and Berg and Garrard's survey[14] of 481 residencies conducted in 1979. It was impossible to compare data concerning the availability of one service—support groups for residents and spouses—collected in both 1979 and 1988, because of incomplete reporting of the 1979 results. The comparisons between specialties were carried out using Kruskal–Wallis and Mann–Whitney paired-group tests, depending on whether responses were ordinal or interval-scaled. Comparisons between the two surveys were made difficult by the fact that while it is likely that some overlap existed between the programs surveyed in 1979 and in 1988, only summary information was available for the earlier years, so it is not known which programs were part of both samples. For purposes of analysis, these samples were assumed to be independent and comparisons were made based on X^2 tests. If the results of the two questionnaires were positively correlated, then these inferences should be more conservative than their nominal significance levels would indicate.

Results

The average numbers of first-year residents per program were 6.5 in family practice, 18 in internal medicine, 5 in obstetrics–gynecology, 11 in pediatrics, 7 in psychiatry, and 11 in surgery.

The mean frequencies of night call for first-year residents in the six specialties ranged from every 3.3 nights in surgery to every 5.8 nights in psychiatry. For the individual specialties, the data on the frequencies of night call were as follows: psychiatry (48 programs), mean, 5.8, range 3–14; internal medicine (92 programs), mean, 4.3, range, 3–10; family practice (180 programs), mean, 4, range 3–12; pediatrics (52 programs), mean, 3.7, range, 3–5; obstetrics–gynecology (53 programs), mean 3.6, range, 2–6; and surgery (68 programs), mean 3.3, range, 2–5. Most programs assigned first-year residents on-call duties every third night or less frequently. Only one of 53 obstetrics–gynecology programs responding (1.89%) and five of 68 surgery programs responding (7.35%) reported night call more often than every third night for first-year residents.

The average lengths of paid vacation for first-year residents in the six specialties were 2.6 weeks for family practice, 3 weeks for surgery, and 2.9 weeks for internal medicine, pediatrics, psychiatry, and obstetrics–gynecology. Most programs offered first-year residents two weeks or more of paid vacation. Five of 180 family practice programs responding (2.78%) offered less than two weeks per year (two offered 1 week, three offered 1.5 weeks). One of 48 psychiatry programs responding (2.08%) offered no vacation for first-year residents.

The most prevalent support services identified were residency-sponsored social activities, available in more than 90% of programs in all spe-

Table 1

Percentages of Residencies in Six Specialties that Offered Specific Support Services, 1988–89*

Service	Family Practice ($n = 180$)	Internal Medicine ($n = 92$)	Obstetrics–Gynecology ($n = 53$)	Pediatrics ($n = 52$)	Psychiatry ($n = 48$)	Surgery ($n = 68$)
Residency-sponsored social activities	94	93	90	93	90	95
Resident retreats	51	27	25	61	90†	15
Formal gripe sessions	94	89	77	91	83	78
Resident participation in program and institutional decision making	95	90	88	87	95	86
Professional counselors in the program	86	71	44	65	53	58
Financial benefits for professional counseling	60	54	56	47	70	58
Financial advisors on staff	43	17	27	30	8	28
Residency orientation week or month	86	60	58	67	73	68
Support groups for residents	72†	30	21	48	58	32
Support groups for residents and spouses	28‡	7	8	9	5	20
Support groups for spouses	27†	10	18	12	5	15
Seminars and/or speakers on emotionally charged medical issues	93†	71	58	83	80	66
Seminars and/or speakers on stresses and conflicts of being a physician	85†	34	31	50	48	43
Seminars on doctor–patient relationships (Balint-type)	44†	11	8	22	28	8
Night float rotations	5	27¶	21	24	3	3
Mental health days off duty	26	32	19	35‖	18	14
Postcall time off duty	15	28	19	37§	15	8
Part-time residency	11	15	2	24	40	0
Child care services	21	20	13	22	8	24

*To determine the percentages of training programs that offered each of 19 support services to residents in 1988–89, the authors surveyed a random sample of 576 residencies; a total of 493 (86%) responded. The response rates by specialty were as follows: obstetrics–gynecology, 74%; internal medicine, 79%; pediatrics, 87%; psychiatry, 87%, surgery, 89%; and family practice, 91%. For a comparison of the results of this survey with those of a similar survey conducted a decade previously, see Table 2.

†Significantly higher than all other specialties ($p < .05$).

‡Significantly higher than all other specialties except surgery ($p < .05$).

§Significantly higher than all other specialties except internal medicine ($p < .05$).

‖Significantly higher than all other specialties except internal medicine and family practice ($p < .05$).

¶Significantly higher than all other specialties except obstetrics-gynecology and pediatrics ($p < .05$).

cialties (Table 1). In contrast to social activities, the percentages of programs that offered resident retreats were significantly ($p < .05$) lower in all specialties except psychiatry. Seventy-seven percent or more of the programs in all specialties studied reported formal gripe sessions, while 86% or more involved residents in program or institutional decision making. Professional counselors were on staff with percentages ranging from 86% in family practice to 44% in obstetrics–gynecology. Similarly, the percentages of programs that offered financial benefits for counseling ranged from 70% in psychiatry to 47% in pediatrics. A majority of programs in all specialties offered residents an orientation week or month.

In all the specialties studied, support groups were offered more often for residents alone than for spouses alone or for residents and spouses together. Family practice programs were more likely to offer support groups for residents than any of the other specialties studied ($p < .05$ in all cases). When compared with Berg and Garrard's data, of all the specialties only family practice showed a significant increase in offering support groups for residents (Table 2).

A majority of programs in the specialties studied offered seminars or speakers dealing with emotionally charged medical issues (Table 1). Family practice programs were significantly ($p < .05$) more likely than any other specialty studied to offer these seminars, as well as seminars or speakers dealing with the stresses and

Table 2

Comparison of the Percentages of Residencies in Six Specialties that Offered Specific Support Services in 1979–80 and in 1988–89*

Service	Family Practice		Internal Medicine		Obstetrics–Gynecology		Pediatrics		Psychiatry		Surgery	
	1979–80 ($n = 88$)	1988–89 ($n = 180$)	1979–80 ($n = 81$)	1988–89 ($n = 92$)	1979–80 ($n = 70$)	1988–89 ($n = 53$)	1979–80 ($n = 81$)	1988–89 ($n = 52$)	1979–80 ($n = 82$)	1988–89 ($n = 48$)	1979–80 ($n = 79$)	1988–89 ($n = 68$)
Residency-sponsored social activities	91	94	93	93	80	90	94	93	87	90	85	95
Formal gripe sessions	90	94	72	89	76	77	77	91	88	83	78	78
Professional counselors on staff	83	86	64	71	99	44‡	69	65	76	53	54	58
Financial advisor on staff	57	43	22	17	17	27	20	30	9	8	20	28
Support groups for residents	59	72†	25	30	26	21	37	48	68	58	20	32
Seminars and/or speakers on emotionally charged medical issues	93	93	70	71	67	58	84	83	85	80	63	66
Seminars and/or speakers on stresses and conflicts of being a physician	72	85†	23	34	23	31	19	50†	51	48	22	43†
Part-time residency	13	11‡	27	15‡	16	2‡	25	24	60	40‡	5	0‡
Child care services	7	21†	14	20	10	13	6	22†	9	8	11	24†

*To determine the percentages of training programs that offered each of 19 support services to residents in 1988–89, the authors surveyed a random sample of 576 residencies; 493 responded. The authors then compared their results regarding nine services with those from a survey of 481 programs conducted by other researchers a decade previously, in 1979.

†Significant increase ($p < .05$).

‡Significant decrease ($p < .05$).

conflicts of being a physician and Balint-type seminars. Over the past decade, programs in family practice, pediatrics, and surgery showed significant increases in seminars offered on the stresses and conflicts of being a physician (Table 2).

As shown in Table 1, programs in internal medicine, obstetrics–gynecology, and pediatrics offered significantly more night float rotations (residents working night shifts without daytime responsibilities) than did programs in family practice, psychiatry, and surgery ($p < .05$). Programs in all the specialties studied except obstetrics–gynecology offered mental health days or postcall time off more often than formal night floats.

In the past decade, all specialties except pediatrics have significantly decreased offering part-time residencies (Table 2). During the same period, programs in family practice, pediatrics, and surgery more than doubled their offerings of child care services.

Discussion

Support groups have been particularly effective in providing support for residents.[15–17] When asked to identify support services desired but not present in their programs, family practice residents have identified support groups as most desired.[18] Residents impaired by drug use or emotional illness commonly feel a sense of hopelessness and isolation.[7] Support groups may be particularly useful in combating the isolation perceived by residents. The opportunity to ventilate negative feelings, to share with and to be supported by one's peers, may assist in preventing impairment among some residents.

Five of the six specialties studied offered fewer part-time residencies than a decade previously. Pediatrics residencies, which traditionally have had high percentages of women residents, have not changed significantly their offerings of part-time residencies. Only 5% of the surgery programs offered part-time residencies a decade earlier, and none reported such in 1988–89, while the percentage of such residencies offered by the obstetrics–gynecology programs decreased from 16% to 2%. While part-time residencies have traditionally been occupied by women residents, especially women with children, the decrease in frequency of part-time residencies occurred over a decade in which there has been an increasing percentage of women in medicine, particularly in obstetrics–gynecology. An explanation for the decrease in part-time residencies may lie in the

difficulties experienced by program directors in attempting to solve the administrative and scheduling problems created when mixing traditional and alternative residency schedules. An additional explanation may be that the more surgery-oriented specialties have excluded part-time residencies from the rigorous culture of surgery training. Also, residents themselves may have been reluctant to lengthen their training.

It may have been easier for programs to offer residents days off, or portions thereof, than months off (part-time residencies). Programs in all specialties except psychiatry offered more postcall time off or mental health days than part-time residencies. Psychiatry may have stood apart from the other specialties studied because it required less frequent night call and subsequently less need for postcall time off or mental health days. Similarly, it may have been easier to schedule psychiatry residents in part-time residencies that extended beyond the usual course of training, because of an emphasis on continuity with patients rather than monthly rotations.

Over the last decade, there has been a marked increase in the availability of child care services in all specialties studied except psychiatry. The increasing number of women in medicine may, in part, have accounted for this increase. Alternatively, the increase of women, and women with children, in the general work force may have resulted in more child care services offered in institutions sponsoring residencies, thus benefitting medical trainees as a byproduct. Offering child care may be logistically easier for a residency or sponsoring institution than coping with the confusion of scheduling part-time or alternative residencies.

Night floats are a relatively recent change in residency rotation scheduling, and therefore were not surveyed previously. Nonetheless, it is of interest that programs in internal medicine, obstetrics/gynecology, and pediatrics in 1988–89 were significantly more likely to incorporate night floats into their rotation schedules than were family practice, psychiatry, or surgery programs. The low availability in family practice programs may have resulted from one of two factors. First, programs in university hospitals may have found themselves not controlling their own rotation schedules but rather using services controlled by other departments. Second, those programs in community hospitals where family practice was the only training program may have found the need to cover all services with a limited number of residents. This may have precluded the scheduling of a night float rotation without the expense of adding residents. Psychiatry's low availability of night float rotations again may reflect the infrequency of night call. The low frequency of night float rotations in surgery programs may be explained by the use of "24 on/24 off" rotations, or by an emphasis on continuity between resident and patient common to surgery training programs.

A range from 58% to 93% of programs offered seminars and speakers on emotionally charged medical issues, without much change in each specialty over a decade. Family practice, pediatrics, and surgery programs increased the availability, over a decade, of seminars and speakers dealing with the stresses and conflicts of being a physician. The availability of such seminars in psychiatry remained relatively high. The increased availability of these seminars may reflect increased attention to residents' (and ultimately physicians') well-being.

Balint-type seminars[19-23] are named for the British psychoanalyst Michael Balint and can be defined generically as seminars dealing with troubling doctor–patient relationships. Balint-type seminars were offered less frequently than seminars and speakers on either emotionally charged medical issues or the stresses and conflicts of being a physician. The lesser availability of Balint-type seminars may reflect the absence of trained Balint facilitators, less emphasis on dealing with the doctor–patient relationship and "problem patients," or the logistical difficulty of offering ongoing seminars as contrasted to offering episodic lectures.

This survey attempted to highlight support services that the authors presumed to be both prevalent and important for reducing residents' stress and increasing residents' well-being. Other services not surveyed, such as residents' advisors or salary, may also be important in combatting residents' stress. The presence or absence of support services does not necessarily translate into an overall supportive atmosphere for residents. Many other factors, such as the quality of faculty, type of patients, composition of the cohort group, training requirements, and health care economics also can affect residents' well-being.

The results of this survey may have been affected by who responded to the questions. Either program directors and/or department chiefs identified themselves as the respondents to 90% of the questionnaires. Ten percent or less of the questionnaires were filled out by administrative staff or by chief residents. Experience with other surveys has revealed that program directors may identify more support services than do residents.[18] The explanation may lie either in a greater awareness by program directors of what is offered or in identification of more services offered than are practically available to residents.

Because of lack of specificity in the wording of the questions, a respondent's interpretation of a question may have differed from the interpretations of other respondents and of the authors. For example, positive responses to the question about the availability of Balint-type seminars do not discriminate between programs with Balint seminars running a few weeks each year and programs offering weekly Balint seminars over the full three years of residency, nor do such responses describe the resulting impacts such differences may have on residents' support. We hope that further research will address the effects of the availability of support services on residents' stress, support, and well-being.

Conclusion

This study was begun with two questions: First, are there differences be-

tween specialties in the amounts and kinds of support services offered to residents? And second, do current levels of support services differ from those of a decade earlier? We found, on the one hand, that the prevalences of residency-sponsored social activities, professional counselors on staff, and seminars and/or speakers dealing with emotionally charged medical issues were high across specialties and consistent over the past decade. On the other hand, the availability of part-time residencies was low in most specialties and diminished over the decade, whereas the availability of seminars and/or speakers on the stresses and conflicts of being a physician and child care services increased markedly over the decade.

Even with increased attention to residents' working hours and supervision and to the potential negative consequences of stressful working conditions to both patients and residents, graduate medical education has much room to improve in its support of residents. With or without mounting external pressure, residencies can choose to implement support services. The authors' hope is that this study will stimulate the voluntary implementation of support services for residents, thus further humanizing graduate medial education and tomorrow's practicing physicians.

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AAMC PAPERS

Relationship between Third-year Clerkships in Family Medicine and Graduating Students' Choices of Family Practice Careers

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Academic Medicine
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Relationship between Third-year Clerkships in Family Medicine and Graduating Students' Choices of Family Practice Careers

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The AAMC's Medical Student Graduation Questionnaire (GQ) continues to show that the third-year clinical clerkships are among the factors significantly influencing students' choices of specialty training and practice. Family practice advocates believe that a third-year clerkship in family medicine will catalyze interest in that specialty,[1-4] although that assumption has not hitherto been validated on a national scale. Babbott and colleagues[5] showed that the majority of students who matched in family practice residencies came from a pool of students who had favored that specialty at the time of taking the Medical College Admission Test (MCAT); yet only 24% of those indicating interest in family practice at the time of the MCAT still showed interest in that specialty on the subsequent GQ. With that in mind, Garrett and Dietrich[6] recently joined the chorus advocating the exposure of students to family physician role models in order to counter influences that might turn students away from their earlier leaning toward family practice. In corroboration, Carline and Greer[7] have reported that in one medical school with a third-year family medicine clerkship 98% of the students who made an early choice of family practice stuck with that decision.

The relationship between required third-year clerkships in family medicine and students' choices of family practice careers has been examined using several AAMC data sources. Accredited U.S. medical schools were categorized according to the presence or absence of a required family medicine clerkship of at least four weeks' duration in the third year under the direction of the department of family medicine (also called family and community medicine/health or family practice). A "primary care" or "ambulatory care" clerkship or preceptorship in the third year was classified as family medicine if the experience was obligatory for all students and predominantly family medicine (as opposed to internal medicine and/or pediatrics). Fourth-year family medicine clerkships, required or optional, were ignored for purposes of this study because they occur generally after students have crystallized their plans for graduate medical training.

The 1990 GQ was examined for senior students' plans for specialty training and certification. Of the 126 accredited U.S. medical schools, 121 were studied: 57 with and 64 without required third-year family medicine clerkships. Five schools were excluded from the study. Four were outliers because, although they did not have required third-year clerkships in family medicine, there was an unusual prominence of family physicians and significant exposure of students to family and community medicine during the introductory clinical experience of the first two years, accompanied by high rates of family practice career choices amongst graduating seniors. The fifth excluded school was the single two-year medical school, and its data were pooled with those from the school in the same state to which these students transfer for clinical education in the third and fourth years.

Students' responses to two items in the 1990 GQ were noted: first choice of family practice residency in the first postgraduate year (PGY-1); and plans to seek certification in family practice as the specialty of first choice.

In addition to the plans that the seniors declared on the GQ, the actual 1991 appointments in family practice PGY-1 residency positions were examined in relation to whether the students graduated from schools with or without required third-year clerkships in family medicine.

While there were responses to the GQ for all schools included in the study, the overall response rate was 75% of all students graduating in 1990. By contrast, all graduates who matched with PGY-1 residency positions in 1991 were accounted for.

Nationally, 10.6% of seniors completing the 1990 GQ indicated that their first choice was a PGY-1 residency position in family practice, and 10.7% indicated that they planned to seek

TABLE 1. Mean Percentages of Senior Students Planning PGY-1 Residencies and Eventual Certification in Family Practice in Schools with and without Required Family Medicine Clerkships, 1990*

Type of School	% Graduates Planning PGY-1 Residencies in Family Practice	% Graduates Planning Certification in Family Practice
With required third-year clerkship in family medicine ($n = 57$)	15.6	15.5
Without required third-year clerkship in family medicine ($n = 64$)	6.9	7.0

*Source: 1990 AAMC Medical School Graduation Questionnaire

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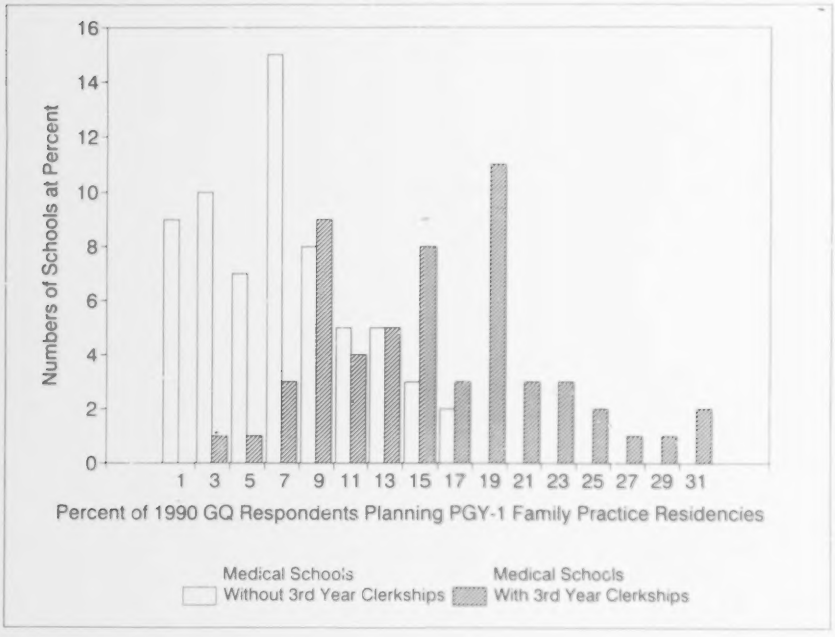

FIGURE 1. Distributions of medical schools, with and without required third-year clerkships in family medicine, according to the percentages of graduating seniors indicating plans for a PGY-1 residency position in family practice on the 1990 Medical Student Graduation Questionnaire.

specialty certification in family practice. For U.S. senior students participating in the National Resident Matching Program in 1991, 10.6% matched in PGY-1 positions in family practice.[8]

Table 1 shows that a mean of 15.6% of the 1990 GQ respondents from schools with required third-year clerkships in family medicine intended to seek family practice PGY-1 residency positions as their first choices, and a mean of 15.5% planned certification in that specialty. In contrast, a mean of 6.9% of the seniors graduating from schools without third-year clerkships intended to seek family practice residency positions as their first

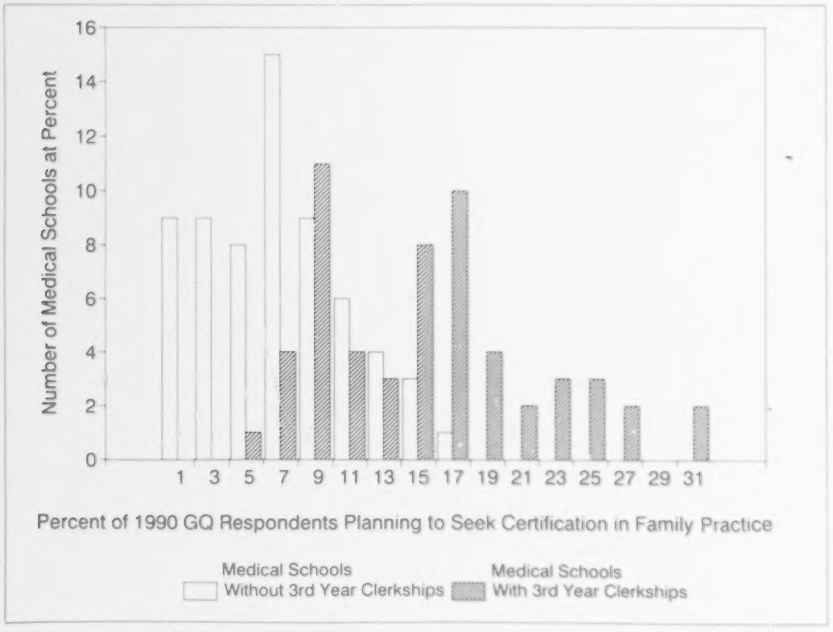

FIGURE 2. Distributions of medical schools, with and without required third-year clerkships in family medicine, according to the percentages of graduating seniors indicating plans for certification in family practice on the 1990 Medical Student Graduation Questionnaire.

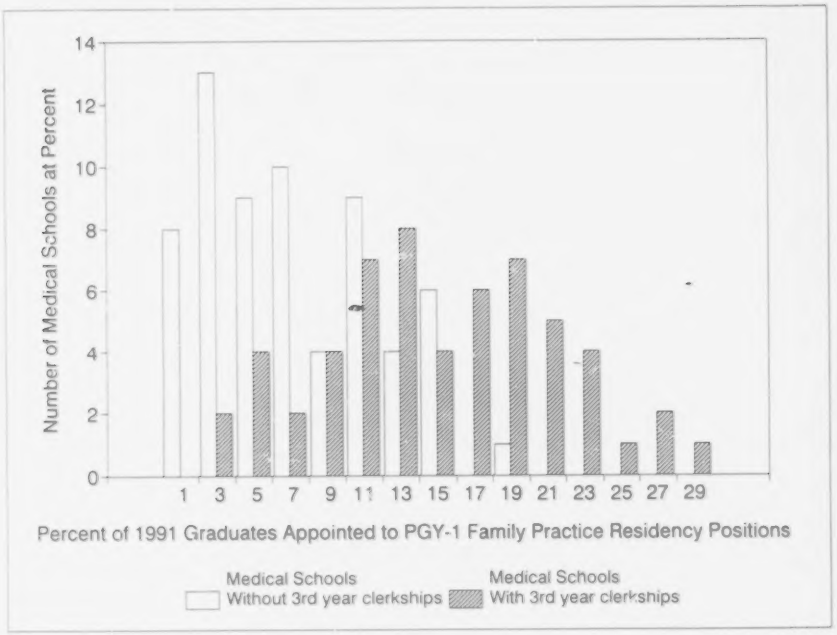
Number of Medical Schools at Percent
14
12
10
8
6
4
2
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
Percent of 1991 Graduates Appointed to PGY-1 Family Practice Residency Positions
Medical Schools Without 3rd year clerkships
Medical Schools With 3rd year clerkships

FIGURE 3. Distributions of medical schools, with and without required third-year clerkships in family medicine, according to the percentages of 1991 graduates appointed to PGY-1 residency positions in family practice.

choices, and a mean of 7.0% planned certification in family practice.

Figures 1 and 2 show the distributions of the medical schools in the study, with and without required third-year clerkships in family medicine, according to the percentages of graduating seniors who indicated plans for a PGY-1 residency position and for specialty certification in family practice. While there clearly are two distributions, related to the presence or absence of a third-year clerkship in family medicine, it is also apparent that in some instances the students' choices were not driven by third-year exposure to family medicine.

Table 2 shows that a mean of 14.7% of graduates of medical schools with required third-year clerkships in family medicine were appointed to PGY-1 family practice residency positions in 1991, compared with a mean of 7.2% of graduates of schools without such clerkships.

Figure 3 shows the distributions of medical schools, with and without required third-year clerkships in family medicine, according to the percentages of 1991 graduates appointed to PGY-1 residency positions in family practice. The distributions are similar to those derived from students' plans indicated on the GQ.

TABLE 2. Mean Percentages of Graduates Appointed in 1991 to PGY-1 Residency Positions in Family Practice Who Trained at Schools with and without Required Family Medicine Clerkships

Type of School	% Graduates Appointed to PGY-1 Residencies in Family Practice
With required third-year clerkship in family medicine ($n = 57$)	14.7
Without required third-year clerkship in family medicine ($n = 64$)	7.2

The presence of a department of family medicine at a given school was not itself a determinant; two-thirds of the schools without required third-year family medicine clerkships have departments of family medicine and graduate medical education programs in family practice.

While not a panacea, a required third-year family medicine clerkship of at least four weeks is associated with a higher percentage of students choosing training and specialty certification in family practice. The data do not differentiate whether the clerkship reinforces pre-existing interest or inspires it de novo.

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ACADEMIC MEDICINE

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■

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